A report on the achievements of subgroup 19 on Activation Cross Sections of the WPEC, OECD-NEA

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Subgroup 19 on Activation Cross Sections of the Working Party on Evaluation Cooperation of the OECD-NEA has recently concluded its activities. The goal of the subgroup was to generate a large set of new measured activation cross sections relevant to nuclear applications and make these data available to the nuclear science community. In addition, modeling efforts and sensitivity studies were undertaken to evaluate the use of measured data and model calculations for the prediction of unknown cross sections. The latter addresses the potential of model calculations to satisfy issues on the High Priority Request List when no measured data are available. In the course of the activities of the subgroup over ninety reaction channels were studied experimentally. All except the most recent of these data have been compiled into Exfor format by members of the subgroup and submitted to OECD-NEA. As a result most of these data can now be retrieved online from the data centers. A systematic comparison was made with the new evaluated data files JEF3.0/EAF2003, JENDL3.3 and ENDF/B-VI.8 and with the current status of the global parameter systematics of the model code Talys. In addition, a considerable number of locally optimized parameter sets were developped. Both the global and local approaches emphasize the use of consistent physics modelling for all important reaction channels and nuclides involved in the decay. Comparison of the two approaches allows to assess the effort required when model estimates to a certain accuracy must be made. Parameter sensitivity studies were undertaken to further assess the accuracy requirements on model parameters if target uncertainties for the cross sections have been specified. The value of this approach has demonstrated itself and indicates the need for model codes that fit all available experimental data in order to connect the data covariance with the covariance of the model predictions. The work of the subgroup was a joint effort between IRMM, ANL, FZ-Jülich, INRNE Sofia, NIPNE Bucharest, IEP and Atomki Debrecen, JAERI, and Tohoku University. A comprehensive review of the subgroup activities will be presented.

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